

IN THE CLAIMS

1-142. (Cancelled)

143. (Withdrawn) A hole puncher, adapted for punching a hole in a blood vessel, comprising:

an outer tube having a distal portion, which distal portion has a lip;

a punch element having a sharp tip suitable for penetrating a blood vessel and defining a depression distal from the tip, wherein said depression is of a size adapted to receive a blood vessel such that a substantially blood-proof seal is formed between the vessel and the depression,

wherein said distal portion of said outer tube has an outer diameter which is substantially the same as an outer diameter of said punch element and wherein said punch element fits snugly in said distal portion such that said lip can sever blood vessel tissue contained in said depression from tissue outside said depression.

144. (Withdrawn) A hole puncher according to claim 143, wherein said depression is distanced from said tip so that said distance is at least the thickness of the blood vessel.

145. (Withdrawn) A puncher according to claim 143, wherein said puncher is flexible enough to be provided through a blood vessel in which a hole is to be punched.

146. (Withdrawn) A puncher according to claim 143, comprising a handle.

147. (Withdrawn) A puncher according to claim 146, comprising means for advancing said outer tube relative to said handle and relative to said punch element.

148. (Withdrawn) A puncher according to claim 146, comprising means for retracting said punch element relative to said handle and relative to said outer tube.

149. (Withdrawn) A puncher according to claim 143, comprising means for advancing a graft into said hole formed by said punch.

150. (Withdrawn) A puncher according to claim 143, comprising a valve for preventing blood from leaking out of said outer tube once said punch element is removed.

151. (Withdrawn) A puncher according to claim 143, wherein said distal portion comprises a stop for preventing entry of said distal portion into said hole beyond said stop.

152. (Withdrawn) A puncher according to claim 151, wherein said stop is at an oblique angle relative to a main axis of said distal portion, to guide said hole puncher to form an oblique punch.

153. (Withdrawn) A puncher according to claim 143, comprising a stop for preventing advance of said punch element relative to said distal portion, beyond a pre-defined distance.

154. (Withdrawn) A puncher according to claim 143, wherein said punch element is radially expandable from a first, small diameter to a second, working diameter.

155. (Withdrawn) A puncher according to claim 143, wherein said distal portion is radially expandable from a first, small diameter to a second, working diameter.

156. (Withdrawn) A puncher according to claim 143, wherein said depression in said punch element is at an oblique angle relative to a main axis of said punch element, whereby an oblique hole is punched thereby.

157. (Withdrawn) A puncher according to claim 143, wherein said lip of said outer tube is at an oblique angle relative to a main axis of said outer tube, whereby an oblique hole is punched thereby.

158. (Withdrawn) A puncher according to claim 143, wherein said hole puncher is arranged to punch an oblong hole.

159-199. (Cancelled)

200. (Withdrawn) A method of punching a hole in a blood vessel, comprising:
providing a hole puncher to a location in a vascular system, which location has blood flowing therethrough;
transfixing a wall of said vascular system at said location;
removing a portion of said wall using said hole puncher, while said hole-puncher remains transfixing said wall; and
transporting a tool across said wall through a lumen of said hole puncher.

201. (Withdrawn) A method according to claim 200, wherein said removing comprises partially retracting a portion of said hole puncher.

202. (Withdrawn) A method according to claim 200, wherein said removing comprises partially advancing a portion of said hole puncher.

203. (Withdrawn) A method according to claim 200, comprising using said tool to perform an anastomosis connection.

204. (Withdrawn) A method according to claim 200, wherein said providing is from inside of said vascular system.

205. (Withdrawn) A method according to claim 200, wherein said providing is from outside of said vascular system.

206-218. (Cancelled)

219. (Withdrawn) A hole puncher, adapted for punching a hole in a blood vessel, comprising:
an outer tube;
a punch element adapted to pass through the outer tube and to at least participate in punching a hole in a blood vessel; and

a valve within the outer tube for preventing blood from leaking out of the blood vessel through the outer tube, when the punch element is removed from the outer tube.

220. (Withdrawn) A hole puncher according to claim 219, wherein the punch element passes through the valve when removed from the vicinity of the blood vessel.

221. (Withdrawn) A hole puncher according to claim 219, wherein the punch element is adapted to punch a hole in the blood vessel together with a distal portion of the outer tube.

222. (Withdrawn) A hole puncher according to claim 219, wherein the punch element is adapted to punch a hole in the blood vessel substantially without cooperation with any other element of the hole puncher.

223. (Withdrawn) A hole puncher according to claim 219, wherein the valve comprises a tri-leaflet valve.

224. (Withdrawn) A hole puncher according to claim 219, wherein the valve comprises a silicon gasket.

225. (Withdrawn) A hole puncher according to claim 219, comprising a pressure relief exit in the outer tube, for allowing blood to exit the outer tube when a tube is inserted into the outer tube.

226. (Withdrawn) A hole puncher according to claim 225, wherein the pressure relief exit is located farther from the blood vessel than the valve.

227. (Withdrawn) A method according to claim 200, wherein transporting a tool across said wall through a lumen of said hole puncher comprises removing a sub-assembly of the hole puncher from the lumen and transporting the tool through the lumen from which the sub-assembly of the hole puncher was removed.

228. (Withdrawn) A method according to claim 227, wherein removing the sub-assembly of the hole puncher comprises removing a sub-assembly including a hole making pin and a protective sleeve surrounding the hole making pin.

229. (Withdrawn) A method according to claim 228, wherein the protective sleeve surrounding the hole making pin participates in removing the portion of the wall.

230. (Withdrawn) A method according to claim 227, wherein removing the sub-assembly of the hole puncher comprises removing a sub-assembly including a hole making pin but does not include a protective sleeve surrounding the hole making pin.

231. (Withdrawn) A method according to claim 230, wherein the protective sleeve surrounding the hole making pin participates in removing the portion of the wall.

232. (Withdrawn) A method according to claim 227, wherein removing the sub-assembly of the hole puncher comprises removing the sub-assembly while an extension of the hole puncher remains within a hole defined around the removed portion of the transfixed wall.

233. (Currently amended) A method of providing a connector to a blood vessel, comprising:

providing a distal end of a hole puncher adjacent a blood vessel;

punching a hole in the blood vessel, by the hole puncher; and

transporting a connector including at least one spike for attaching to the blood vessel through a lumen of the hole puncher, while the distal end of the hole puncher is adjacent the blood vessel; and

engaging the blood vessel punched by the hole puncher, by the at least one spike.

234. (Previously presented) A method according to claim 233, wherein providing the hole puncher against the outer wall comprises pressing the hole puncher against the outer wall of the blood vessel.

235. (cancelled)

236. (Previously presented) A method according to claim 233, comprising removing a sub-assembly of the hole puncher from a channel of the hole puncher, while the hole puncher is adjacent the blood vessel and transporting the connector through the channel from which the sub-assembly was removed.

237. (Previously presented) A method according to claim 236, wherein removing the sub-assembly comprises removing a central cutter and a surrounding sheath.

238. (Currently amended) A method according to claim 236, wherein removing the sub-assembly comprises removing a central cutter while a surrounding sheath, that participated in the punching of the hole, remains with an end adjacent the blood vessel.

239. (Previously presented) A method according to claim 233, wherein transporting the connector through the lumen is performed while the hole puncher is in contact with the blood vessel.

240. (Currently amended) A method of treating a blood vessel, comprising:
providing a hole puncher, including a tissue engager and a surrounding sheath, adjacent a blood vessel;
punching a hole in the blood vessel by the hole puncher, utilizing the surrounding sheath;
removing the tissue engager from a channel of the hole puncher, while the surrounding sheath, utilized in the punching, remains in the vicinity of the blood vessel;
and
transporting a tool other than the tissue engager through the channel, to the vicinity of the blood vessel.

241. (Previously presented) A method according to claim 240, wherein the tool other than the tissue engager comprises a connector.

242. (Previously presented) A method according to claim 241, wherein the connector comprises at least one spike.

243. (Previously presented) A method according to claim 240, wherein punching the hole is performed utilizing both the tissue engager and the surrounding sheath.

244. (Previously presented) A method according to claim 240, wherein the tissue engager includes an indent adapted to engage a wall of the blood vessel.

245. (Previously presented) A method according to claim 240, wherein the tissue engager has a sharp distal end adapted to penetrate a hole in the blood vessel.

246. (Previously presented) A method according to claim 240, wherein the tissue engager is rotatable while being adjacent the blood vessel.

247. (Previously presented) A method according to claim 246, wherein the tissue engager is rotatable relative to the outer sheath, while being adjacent the blood vessel.

248. (Previously presented) A method according to claim 240, wherein the tissue engager is adapted to be vibrated while being adjacent the blood vessel.

249. (New) A method according to claim 240, wherein punching a hole in the blood vessel comprises rotating the tissue engager adjacent the blood vessel.

250. (New) A method according to claim 249, wherein punching a hole in the blood vessel comprises rotating the tissue engager, relative to the outer sheath, adjacent the blood vessel.

251. (New) A method according to claim 240, wherein punching a hole in the blood vessel comprises vibrating the tissue engager adjacent the blood vessel.